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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,359	09/25/2003	Charles Zdzislaw Loboz	614-L	7112
27201	7590	11/15/2007		
UNISYS CORPORATION 25725 JERONIMO ROAD, MS400 MISSION VIEJO, CA 92691			EXAMINER TIMBLIN, ROBERT M	
			ART UNIT	PAPER NUMBER
			2167	
			MAIL DATE	DELIVERY MODE
			11/15/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/671,359

Applicant(s)

LOBOZ ET AL.

Examiner

Robert M. Timblin

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2167

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action corresponds to application 10/671,359 filed 9/25/2003.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/24/2007 has been entered.

#### ***Response to Amendment***

In the present Application, claims 21-25 are newly added and are pending. All previous claims have been cancelled at the request of the Applicant.

#### ***Claim Objections***

Claims 22 and 24 objected to because of the following informalities: these claims should begin with "The" rather than "A" as to clearly define their dependence on a previous claim. Appropriate correction is respectfully requested.

Claim 23 is objected to because of the following informalities: there should be a comma (,) after "entities" in line 3 of the claim. Appropriate correction is respectfully requested.

Claim 24 is objected to because of the following informalities: there should be only one colon (:) to conclude the preamble (i.e. there is presently two colons). Appropriate correction is respectfully requested.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Where means plus function language is used to define the characteristics of a machine or manufacture invention, such language must be interpreted to read on only the structures or materials disclosed in the specification and "equivalents thereof" that correspond to the recited function (MPEP 2105).

Specifically, the subject matter included in the "means" language is unclear in scope (i.e. it is not clear what structure the "means" defines from an interpretation gleaned from the specification).

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 23-24 are rejected under 35 U.S.C. 101 because they may be construed to incorporate software per se (i.e. a program), thus being functional descriptive material per se and not statutory. As the means in these claims are unclear as to what they define, they can be interpreted as software per se (i.e. page 9, lines 19-23 describe that the present invention may be executed on any suitable computing system, with any suitable hardware and/or *software*. MPEP 2106.01 states computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krychniak (U.S. Patent 6,192,357) in view of Prabhakaran et al. ("Prabhakaran" hereafter) (U.S. Patent 6,859,758) and further in view of Tenorio et al. ("Tenorio" hereafter) (U.S. Patent 6,708,161).

With respect to claim 21, Krychniak teaches A method for improving the performance of a database including at least one set of linked entities, wherein the at least one set of linked entities contains a plurality of conceptual entities, each of the conceptual entities including a plurality of data values which are distributed amongst the plurality of the conceptual entities, comprising the steps of:

(iiia) defining an additional entity table (figure 1, fact table) in the database (drawing reference 6, figure 3); and

(iiib) storing in the additional entity table (figure 1, fact table) an aggregation of said plurality of data values (i.e. fact table contains the keys of the dimensional table) representing an aggregation of at least one of the plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c), whereby the information defining the conceptual entity is obtained by performing a single read operation (co. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a join query is avoided) on the additional entity table (figure 1, fact table).

Krychniak fails to expressly teach step (i) of determining an average read/write ratio of the plurality of data values and (ii) comparing the average read/write ratio to a predetermined critical read/write ratio.

Prabhakaran, however, teaches step (i) of determining an average read/write ratio (col. 5 line 55-65; e.g. a approximate desired ratio) of the plurality of data values (col. 6 line 27-29) to estimate the performance of the database. Further, Prabhakaran teaches (ii) comparing the average read/write (step 330, col. 5 line 66-67, and col. 6 line 31-47) to suggest comparing the average read/write ratio with other read to write ratios.

In the same field of endeavor, (i.e. query/access performance on differing database implementations), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because an average read/write ratio from Prabhakaran would have given Krychniak the benefit of an efficient threshold on which to determine a specific access method (Krychniak, figure 4 and Krychniak's claim 3). Further, the comparison as taught by Prabhakaran would have given Krychniak a way to compare access performance to decide which access method to perform (needed by Krychniak in figure 4).

Krychniak and Prabhakaran fail to expressly teach in step (ii) a predetermined critical read/write ratio.

Tenorio, however, teaches a critical read/write ratio (col. 17 line 55-59, and figure 6) for comparing implementations (i.e. indexed or not indexed) of a database.

In the same field of endeavor, (i.e. determining access performance), it would have been obvious to one of ordinary skill in the data processing art at the time of the

present invention to combine the teachings of the cited references because Tenorio would have given Krychniak/Prabhakaran a ratio with which to compare performance of access in different implementations for the benefit of choosing an efficient database implementation. Furthermore, the comparison of the average read/write ratio (desired ratio of Prabhakaran) to Tenorio's critical read/write ratio would have given Krychniak a basis on which to define a fact table. This could have been done if (applicant's step (iii)) the average read/write ratio is greater than the critical read/write ratio (i.e. Prabhakaran tries to achieve the desired ratio and therefore the desired (average) ratio is suggested to be greater than the critical ratio) for the benefit of choosing an efficient database implementation.

With respect to claim 22, the combination of Krychniak and Prabhakaran fail to explicitly teach the steps (iia-iiie) for predetermining a critical read/write ratio.

Tenorio, however, teaches a method in accordance with Claim 21, wherein the step (ii) for predetermining the critical read/write ratio includes the further steps of:

(iia) providing data with regard to the time taken (figure 3, i.e. selecting a time period) to perform a read operation (figure 3, drawing reference 202) and a write operation (drawing reference 204) on a first implementation (e.g. an implementation that is indexed) of the said database (drawing reference 32);

(iib) providing data with regard to the time taken to perform a read operation (figure 3, drawing reference 202) and a write operation (drawing reference 204) on a second implementation (e.g. an implementation without an index) of the said database (drawing reference 32);



calculating a read time difference (drawing reference 216 and col. 17 line 45-59) between the time taken to perform a read operation on said first implementation (e.g. an implementation that is indexed) of said database and on said second implementation (e.g. an implementation without an index) of said database (drawing reference 32);

(iid) calculating a write time difference (drawing reference 216 and col. 17 line 45-59) between the time taken to perform a write operation on said first implementation (e.g. an implementation that is indexed) of said database and on said second implementation (e.g. an implementation without an index) of said database (drawing reference 32); and

(iie) calculating the ratio between the read time difference and the write time difference (figure 3 and drawing reference 218) to determine the critical read/write ratio for the database (drawing reference 32).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the present invention to compare the total read and write times for each implementation of the database to provide a critical read/write ratio to compare to the average read/write ratio (taught by Prabhakaran). By doing so, a combination of the prior art would give Krychniak an efficient way of choosing an implementation (i.e. using a fact table or not) to optimize accessing efficiency.

With respect to claim 23, Krychniak teaches A system for modifying a database, comprising:

(a) means for providing at least one set of linked entities (figure 1, dimensions and col. 1 line 26) in the said database (drawing reference 6), wherein the said at least

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one set of linked entities (dimensions) contains a plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c), each of the conceptual entities (dimensions) including a plurality of data values (figure 1, attributes and keys) which are distributed amongst (abstract) the plurality of conceptual entities (dimensional);

(d1) means for defining an additional entity table (figure 1, fact table) in addition to the at least one set of linked entities (dimensions);

(d2) storing means arranged to store, in said additional entity table (figure 1, fact table), the aggregation of said plurality of data values (i.e. fact table contains the keys of the dimensional table) representing an aggregation of at least one said plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c); and

(d3) reading means enabled to read said aggregation of said plurality of data values by performing a single read operation (co. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a join query is avoided) on said additional entity table (fact table) to return the information determining at least one conceptual entity (col. 2 line 9-10).

Krychniak fails to expressly teach determining an average read/write ratio of the plurality of data values and comparing the average read/write ratio to a predetermined critical read/write ratio.

Prabhakaran, however, teaches determining an average read/write ratio (col. 5 line 55-65; e.g. a approximate desired ratio) of the plurality of data values (col. 6 line 27-29) to estimate the performance of the database. Further, Prabhakaran teaches

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comparing the average read/write (step 330, col. 5 line 66-67, and col. 6 line 31-47) to suggest comparing the average read/write ratio with other read to write ratios.

In the same field of endeavor, (i.e. query/access performance on differing database implementations), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because an average read/write ratio from Prabhakaran would have given Krychniak the benefit of an efficient threshold on which to determine a specific access method (Krychniak, figure 4 and Krychniak's claim 3). Further, the comparison as taught by Prabhakaran would have given Krychniak a way to compare access performance to decide which access method to perform (needed by Krychniak in figure 4).

Krychniak and Prabhakaran fail to expressly teach a predetermined critical read/write ratio.

Tenorio, however, teaches a critical read/write ratio (col. 17 line 55-59, and figure 6) for comparing implementations (i.e. indexed or not indexed) of a database.

In the same field of endeavor, (i.e. determining access performance), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because Tenorio would have given Krychniak/Prabhakaran a ratio with which to compare performance of access in different implementations for the benefit of choosing an efficient database implementation. Furthermore, the comparison of the average read/write ratio (desired ratio of Prabhakaran) to Tenorio's critical read/write ratio would have given Krychniak a basis on which to define a fact table. This could have been done if (applicant's step (d))

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the average read/write ratio is greater than the critical read/write ratio (i.e. Prabhakaran tries to achieve the desired ratio and therefore the desired (average) ratio is suggested to be greater than the critical ratio) for the benefit of choosing an efficient database implementation.

With respect to claim 24, the combination of Krychniak and Prabhakaran fail to explicitly teach the steps (ca-ce) for predetermining a critical read/write ratio:

(ca) means for providing data with regard to the time taken (figure 3, i.e. selecting a time period) to perform a read operation (figure 3, drawing reference 202) and a write operation (drawing reference 204) on the data values which are distributed amongst the plurality of entities;

(cb) means for providing data with regard to the time taken (figure 3, i.e. selecting a time period) to perform a read operation (figure 3, drawing reference 202) and a write operation (drawing reference 204) on said additional entity table;

(cc) means for calculating a read time difference (drawing reference 216 and col. 17 line 45-59) between the time taken to perform a read operation (figure 3, drawing reference 202) on the data values which are distributed amongst the plurality of entities (Krychniak, dimension) and on said additional entity table (Krychniak, fact table);

(cd) means for calculating a write time difference (drawing reference 216 and col. 17 line 45-59) between the time taken to perform a write operation on the data values which are distributed amongst the plurality of entities (Krychniak, dimension) and on said additional entity table (Krychniak, fact table); and

(ce) means for calculating the ratio between said read time difference (figure 3 and drawing reference 218) and said write time difference to determine the critical read/write ratio for the database (drawing reference 32).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the present invention to compare the total read and write times for each implementation of the database to provide a critical read/write ratio to compare to the average read/write ratio (taught by Prabhakaran). By doing so, a combination of the prior art would give Krychniak an efficient way of choosing an implementation (i.e. using a fact table or not) to optimize accessing efficiency.

With respect to claim 25, this claim incorporates the limitations found in claim 21 and therefore is rejected for the same reasons.

### ***Response to Arguments***

Applicant's arguments with respect to claims 21-25 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M. Timblin whose telephone number is 571-272-5627. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert M. Timblin



Patent Examiner AU 2167



Primary Examiner

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